भारतीय मानक
Indian Standard

IS 17818 : 2022

दुग्ध उत्पादक पशुओं के लिए कच्चे माल और पूरक आहार सामग्री में अफलाटॉक्सिन बी$_1$ की घटौती — रीति संहिता

Reduction of Aflatoxin B$_1$ in Raw Materials and Supplemental Feeding Stuffs for Milk Producing Animals — Code of Practice

ICS 65.120

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भारतीय मानक ब्यूरो
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February 2022   **Price Group 2**

Animal Husbandry, Feeds and Equipment Sectional Committee, FAD 05

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Animal Husbandry, Feeds and Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

Aflatoxin B_1 contamination in animal feeding stuffs can be a very serious problem, occurring in part due to inadequate storage conditions. This problem gets magnified with high moisture and deficient post-harvest crop handling techniques.

Aflatoxin M_1 (AFM_1) is the hydroxylated metabolite of aflatoxin B_1 (AFB_1) and can be found in milk or milk products obtained from livestock that have ingested contaminated feed. To ensure the lowest possible level of AFM_1 in milk, attention should be given to residues of AFB_1 in the lactating dairy animal's daily feed ration. This standard has therefore been formulated to provide guidance on preventive measures, application of which in the field as well as postharvest, would help in reduction of aflatoxin B_1 levels in animal feeding stuffs. This includes recommended practices at the levels of crop production, harvest, storage and transport.

This standard is based on the Codex Code of Practice for the Reduction of Aflatoxin B_1 in Raw Materials and Supplemental Feeding Stuffs for Milk Producing Animals (CAC/RCP 45-1997).

The composition of the Committee responsible for formulation of the standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CODE OF PRACTICE FOR THE REDUCTION OF AFLATOXIN B_1 IN RAW MATERIALS AND SUPPLEMENTAL FEEDING STUFFS FOR MILK PRODUCING ANIMALS

1 SCOPE

This standard prescribes recommended practices to reduce aflatoxin B_1 contamination in the field and after harvest as an integral part of animal feeding stuff production for milk producing animals.

2 RECOMMENDED PRACTICES

2.1 Crop Production

2.1.1 Prepare seed bed for new crop by destroying or removing the seed heads or fruits (for example, corn ears, peanuts, etc.) of aflatoxin susceptible crops.

2.1.2 Utilize soil tests if possible to determine fertilizer needs and apply fertilizer and soil conditioners to assure adequate soil *p*H and plant nutrition to avoid plant stress, especially during seed development.

2.1.3 When feasible, use seed varieties bred for fungal resistance and field tested for resistance to *Aspergillus flavus*.

2.1.4 As far as practicable, sow and harvest crops at times which will avoid high temperature and drought stress during the period of seed development/maturation.

2.1.5 Minimize insect damage and fungal infection by the proper use of appropriate approved insecticides and fungicides and other appropriate practices within an integrated pest management program.

2.1.6 Use good agronomic practice, including measures which will reduce plant stress. Such measures may include: avoidance of overcrowding of plants by sowing at the recommended row and intra-plant spacings for the species/varieties grown; maintenance of a weed free environment in the growing crop by the use of appropriate approved herbicides and other suitable cultural practices; elimination of fungal vectors in the vicinity of the crop; and crop rotation.

2.1.7 Minimize mechanical damage to crops during cultivation.

2.1.8 Irrigation is a valuable method of reducing plant stress in some growing situations. If irrigation is used, ensure that it is applied evenly and individual plants have an adequate supply of water.

2.2 Harvest

2.2.1 Harvest crops at full maturity unless allowing the crop to continue to full maturity would subject it to extreme heat, rainfall or drought conditions.

2.2.2 As much as possible avoid mechanical damage during harvest.

2.2.3 Where applicable dry crops to a minimum moisture content as quickly as possible.

2.2.4 If crops are harvested at high moisture levels dry immediately after harvest.

2.2.5 Avoid piling or heaping wet freshly harvested commodities for more than a few hours prior to drying or threshing to lessen the risk of fungal growth.

2.2.6 Ensure adequate protection from rain during sun drying.

2.3 Storage

2.3.1 Practice good sanitation for storage structures, wagons, elevators and other containers to ensure that stored crops will not be contaminated. Proper storage conditions include dry, well ventilated structures that provide protection from rain or seepage of ground water.

2.3.2 For bagged commodities, ensure that bags are clean and dry and stack on pallets or incorporate a water impermeable layer between the sacks and the floor.

2.3.3 Ensure that crops to be stored are free of mould and insects and are dried to safe moisture levels (ideally crops should be dried to a moisture content in equilibrium with a relative humidity of 70 percent).

2.3.4 Prevent insect infestation by the use of appropriate approved insecticides.

2.3.5 Ensure that the storage facilities are free of insects and mould by good housekeeping and/or the use of appropriate approved fumigants.

2.3.6 Prevent access by rodents and birds.

2.3.7 Store at as low a temperature as possible. Where possible aerate commodities stored in bulk through continuous circulation of air through the storage vessel to maintain proper temperature and moisture.

2.3.8 Use of a suitable authorized preservative e.g. an organic acid such as propionic acid, may be beneficial in that such acids are effective in killing moulds and fungi and preventing the production of mycotoxins. If organic acids are used, it is important that the amounts added are sufficient to prevent fungal growth and is consistent with the products end use.

2.4 Transport

2.4.1 Make sure that transport containers and vehicles are free of mould, insects and any contaminated material by thoroughly cleaning before use or re-use. Periodic disinfestation with appropriate approved fumigants or other pesticides may be useful.

2.4.2 Protect shipments from moisture by appropriate means such as airtight containers, covering with tarpaulins, etc. Care must be taken in the use of tarpaulins to avoid sweating of the commodity that could lead to local moisture and heat build up which are prime conditions for fungal growth.

2.4.3 Avoid insect and rodent infestation during transport by the use of insect resistant containers or insect and rodent repellent chemical treatments.

2.5 Feed production and disposition of aflatoxin B_1 contaminated animal feeds.

2.5.1 Ensure that milling equipment is kept clean, free of dust and feed accumulation.

2.5.2 Use an appropriate sampling and testing program to monitor outbound and inbound shipments for the presence of aflatoxin B_1. Because aflatoxin B_1 concentration in shipments may be extremely heterogeneous refer to FAO recommendations for sampling plans. Adjust frequency of sampling and testing to take into account conditions conducive to aflatoxin B_1 formation, the regional source of the commodity and prior experience within the growing season.

2.5.3 If aflatoxin B_1 is detected, consider one or more of the following options. In all cases, ensure that the aflatoxin B_1 level of the finished feed is appropriate for its intended use (i.e. maturity and species of animal being fed) and is consistent with national codes and guidelines or qualified veterinary advice.

2.5.3.1 Consider the restriction of aflatoxin B_1 contaminated feed to a percentage of the daily ration such that the daily amount of aflatoxin B_1 ingested would not result in significant residues of aflatoxin M_1 in milk.

2.5.3.2 If feed restriction is not practical, divert the use of highly contaminated feeding stuffs to non-lactating animals only.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Animal Husbandry, Feeds and Equipment Sectional Committee, FAD 05

Organization	*Representative* (*s*)
In Personal Capacity (*Former Director, Indian Veterinary Research Institute, Izzatnagar*)	Dr R. K. Singh (***Chairman***)
All India Poultry Breeders Association, New Delhi	Dr A. K. Rajput Shri G. B. Sundarajan
Animal Welfare Board of India, Faridabad	Dr Prachi Jain Dr Debalina Mitra (*Alternate*)
Association of Indian Pet Food Manufacturers, New Delhi	Dr Kallahalli Umesh Mr Manish Singh (*Alternate*)
CSIR-Central Drug Research Institute, Lucknow	Dr D. S. Upadhyay Dr Dhananjay Hansda (*Alternate*)
Centre for Science and Environment, New Delhi	Shri Amit Khurana
Centre of Analysis and Learning in Livestock and Food, Anand	Dr Rajesh Nair Dr Rajeev Chawla (*Alternate*)
Chhattisgarh Kamdhenu Vishwavidyalaya, Raipur	Dr Sanjay Shakya Dr Manoj Kumar Gendley (*Alternate*)
Compound Livestock Feed Manufacturers Association of India, Navi Mumbai	Ms Chandrika Venkatesh Mr Suresh Deora (*Alternate*)
Department of Animal Husbandry and Dairying, Panchkula	Dr Birender Singh Laura Dr Rajiv Banger (*Alternate*)
Federation of Indian Animal Protection Organizations, New Delhi	Dr Sirjana Nijjar Dr Varnika Singh (*Alternate*)
Food Safety and Standards Authority of India, New Delhi	Dr K. Abirami Ms Manpreet Kour (*Alternate*)
Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana	Dr J. S. Lamba Dr Jasmine Kaur (*Alternate*)
ICAR-Central Avian Research Centre, Bareilly	Director Cari Dr S. K. Bhanja (*Alternate*)
ICAR-Directorate of Poultry Research, Hyderabad	Dr R. N. Chatterjee Dr S. V. Rama Rao (*Alternate*)
ICAR-Central Institute for Research on Buffaloes, Hisar	Dr P. C. Lailer Dr Avijit Dey (*Alternate*)
ICAR-Central Sheep and Wool Research Institute, Avikanagar	Dr Randhir Singh Bhatt Dr Srobana Sarkar (*Alternate*)
ICAR-Indian Veterinary Research Institute, Izzatnagar	Dr A. K. Verma Dr A. K. Pattanaik (*Alternate*)
ICAR-National Research Centre on Equines, Hisar	Dr S. C. Mehta Dr R. A. Legha (*Alternate*)
ICAR-National Research Centre on Pig, Guwahati	Dr Keshab Barman Dr Santanu Banik (*Alternate*)
Indian Council of Agricultural Research, New Delhi	Dr A. K. Tyagi Dr V. K. Saxena (*Alternate*)

Organization	*Representative* (*s*)
Indian Federation of Animal Health Companies, Mumbai	Dr P. G. Phalke Dr Tanweer Alam (*Alternate*)
Ministry of Fisheries, Animal Husbandry and Dairying, Department of Animal Husbandry and Dairying, New Delhi	Dr H. R. Khanna Dr Sujit Nayak (*Alternate* I) Dr Anibencoi Jacob (*Alternate* II)
National Dairy Development Board, Anand	Dr V. Sridhar Dr Pankaj Sherasia (*Alternate*)
National Dairy Research Institute, Karnal	Dr Nitin Tyagi Dr Sachin Kumar (*Alternate*)
National Egg Coordination Committee, New Delhi	Shri Ajit Singh Bhagwati Singh (*Alternate*)
National Institute of Animal Nutrition and Physiology, Bengaluru	Dr Raghavendra Bhatta Dr D. T. Pal (*Alternate*)
North India Poultry Farmers Association, Chandigarh	Shri Sandeep Mehta Shri Parveen Garg (*Alternate*)
Ossein and Gelatine Manufacturers Association of India, Mumbai	Shri A. Kapur Shri Viren C. Mirani (*Alternate*)
PETA India, Mumbai	Dr Manilal Valliyate Ms Swati Sumbly (*Alternate*)
People for Animals, New Delhi	Ms Gauri Maulekhi Ms Shreya Paropkari (*Alternate*)
Poultry Federation of India, Sonipat	Shri Vijay Sardana
Tamil Nadu Veterinary and Animal Sciences University, Chennai	Dr A. Natrajan Dr R. Rajendran (*Alternate*)
BIS Directorate General	Shrimati Suneeti Toteja, Scientist 'E' and Head (FAD) [Representing Director General (*Ex-officio*)]

Member Secretary

Nitasha Doger
Scientist 'D', (FAD), Bis

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